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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

HESSELTINE, RYAN J

ART UNIT PAPER NUMBER

2623

DATE MAILED: 02/03/2004

11

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/672,182

Applicant(s)

DROUOT, ANTOINE

Examiner

Ryan J Hesseltine

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 November 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments on page 6, paragraphs 2 and 3, filed November 18, 2003, with respect to Figure 4 and claims 1 and 2 have been fully considered and are persuasive. The objections to the drawings and claims have been withdrawn.
2. Applicant's arguments on page 6, second to last paragraph, filed November 18, 2003 have been fully considered but they are not persuasive. Applicant states, "Lee, by contrast [to amended claim 1], does not choose 'from among' detected non-edge pixels 'a pixel to be filtered.'" The examiner respectfully disagrees. Lee explicitly discloses that if edge information exists within the 3x3 size filter, the center point is checked to see if it is an edge pixel. If the center is an edge pixel, the original pixel value is output without filtering. Otherwise, if the center pixel is not an edge (non-edge pixel), weighted filtering is performed using the weighted filter 256 (page 14, line 19-26).
3. Applicant's arguments with respect to claims 1-9 have been considered but are moot in view of the new ground(s) of rejection. This is due to the newly-added limitations in claim 1, which states in part, "replacing the chosen pixel with a pixel that is selected from among said chosen pixel and at least one pixel of said pixels within a picture in immediate vertical, horizontal, or diagonal adjacency with said chosen pixel" (emphasis added).

Claim Objections

4. Claim 7 is objected to because of the following informalities: the amendment filed November 18, 2003 listed claim 7 as "Currently Amended." The examiner has not found any

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changes in claim 7 so it has been assumed that applicant intended to list claim 7 as "Original."

Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-4 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (GB 2,321,816, cited on applicant's IDS), hereafter Lee, and further in view of Wilder (USPN 4,642,813, newly cited).

7. Regarding claims 1, 8, and 9, Lee discloses a method of processing data which represent a sequence of pictures, previously encoded and decoded, a filtering device carrying out the method, and a computer-readable storage medium (page 6, line 29-page 7, line 23; page 15, line 6-13), comprising the steps of: examining pixels within a picture of said sequence to detect edge pixels and non-edge pixels (page 9, line 23-page 10, line 10); choosing pixels from among the detected non-edge pixels (center of filter window) a pixel to be filtered (page 12, line 4-17; page 14, line 19-26); replacing the chosen pixel (center pixel) with a pixel value that is calculated (weighted filter) using values selected from among said chosen pixel and at least one pixel of said pixels within a picture in immediate vertical, horizontal, or diagonal adjacency (3 by 3 filter window) with said chosen pixel (Figures 3 and 4; page 11, line 8-23).

8. Lee discloses calculating the new pixel value from pixels immediately adjacent, but does not explicitly disclose that the chosen pixel to be filtered is *replaced* with a pixel that is selected

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from among said chosen pixel and at least one pixel of said pixels within a picture in immediate vertical, horizontal, or diagonal adjacency with said chosen pixel (emphasis added). Wilder discloses electro-optical quality control inspection of elements on a product wherein a spatial filter 14 including a median filter 38 replaces a pixel with the median of two previous (horizontally adjacent) pixels, the present (chosen) pixel (to be filtered), and two subsequent (horizontally adjacent) pixels (column 3, line 13-22). It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the chosen pixel to be filtered with a pixel selected from among said chosen pixel and at least one of said pixels within a picture in immediate horizontal adjacency as taught by Wilder in order to eliminate spike or speckle noise of one or two pixel dimensions and reduce noise without degrading the response to a graphic pattern (column 16, line 62-column 17, line 5).

9. Regarding claim 2, Lee discloses that the selected pixel is replaced with a value calculated using a weighted filter using a set of pixels which were not detected as edges (filter weight set to zero if arbitrary edge points), and Wilder discloses that the selected pixel is the median pixel of a set having an odd number of members (five pixels), at least one of said odd number of members being said chosen (present) pixel, said odd number of members comprising said at least one pixel in immediate vertical, horizontal, or diagonal adjacency (column 3, line 13-22; column 16, line 62-column 17, line 5).

10. Regarding claim 3, Lee inherently discloses that the method is applied to the luminance component of the pixels of said picture (page 8, line 14-34).

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11. Regarding claim 4, Lee discloses that a pixel is detected as an edge if a magnitude representative of a gradient of the pixel is greater than a predetermined threshold (page 9, line 23-33).

12. Regarding claim 7, Lee discloses that a pixel is filtered if the number of edge pixels in a defined neighborhood of the pixel lies within a defined range (page 14, line 12-33).

13. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee in view of Wilder as applied to claim 4 above, and further in view of Gupta et al. (USPN 5,852,475, previously cited), hereafter Gupta.

14. Regarding claims 5 and 6, Lee discloses that a pixel is detected as an edge pixel if either the horizontal or vertical component of a gradient of said pixel is greater than a threshold (Tbh or Tbv; page 13, line 1-19), but does not explicitly disclose the claimed method. Gupta discloses a transform artifact reduction process wherein a plurality of different Sobel-based operators are used to determine edge directions within a three-by-three windows surrounding a pixel of interest (column 16, line 19-53). Gupta further discloses combining the plurality of spatial gradients to obtain the center pixel gradient by weighting different pixels within the window (column 16, line 54-column 17, line 42). Gupta does not explicitly state that the modulus of said gradient is compared with the modulus of the gradient of the adjacent pixels, but it is inherent that if a pixel is detected as an edge that the pixels on either side of that edge will have a gradient magnitude less than that of the pixel lying on the edge. It would have been obvious to one of ordinary skill in the art at the time the invention was made to detect horizontal and vertical edges as taught by Gupta in order to generate a pixel texture estimator for each of the possible edges in

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a three-by-three window using weighting based on Sobel operators which has been widely tested and reported as providing good performance (column 17, line 9-24).

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. USPN 5,999,639 to Rogers et al. discloses a method and system for automated detection of clustered micro-calcifications from digital mammograms including reducing noise using a cross-shaped median filter. USPN 6,343,158 to Shiohara discloses an apparatus for converting gray levels of an image including an edge-preserving smoothing operation using a median filter. USPN 6,539,125 to Harrington discloses a modified median filter that better preserves textures. USPN 6,603,877 to Bishop discloses a method and apparatus for optical imaging inspection of multi-material objects including a median filter for analyzing sharp boundaries.

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan J Hesseltine whose telephone number is 703-306-4069.

The examiner can normally be reached on Monday - Friday, 8:30 AM - 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703-308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-0377.

rjh
January 29, 2004

JINGGE WU
PRIMARY EXAMINER

